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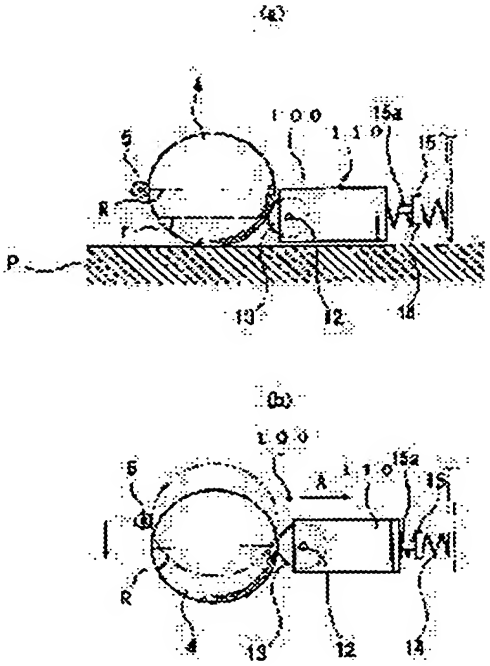
(71)Applicant : FUNAI ELECTRIC CO LTD
FUNAI ELECTRIC ENG CO LTD
(72)Inventor : NOZAWA KAZUHIRO

(54) WIRELESS MOUSE

(57)Abstract:
PROBLEM TO BE SOLVED: To provide a wireless mouse which can be switched to functions to remote control various electric devices.
SOLUTION: The wireless mouse having at least a ball (mouse ball 4) placed turnably in a case 2, two rotary axes (5, 6) in contact with the ball and placed orthogonally to each other, rotation amount detection means (optical rotation encoders E1, E2) that detect the rotated amount of the rotary axes, one input means or two or more (pushbuttons 10, 11, a rotating wheel devices 20), an information transmission means (infrared ray output section 30) that transmits the rotated amount detected by the rotation amount detection means and an input signal from the input means to an information device by a wireless system employing an infrared ray, and a power supply that supplies power to each section, is provided with a ground detection means (pressing roller mechanism 100) that detects whether or not the ball is connected to ground, and a function changeover means (controller) that switches the function of the input means into an operation means to remote control various electric devices (television receiver or the like) on the basis of an output of the ground detection means.



LEGAL STATUS

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CLAIMS

[Claim(s)]
[Claim 1] The ball arranged pivotable in a case, and two revolving shafts installed so that this ball might be contacted and it might intersect perpendicularly mutually, The press roller for pressing said ball to said revolving shaft, and a rotation detection means to detect the rotation of said revolving shaft, One or two or more input means, and an information-transmission means to transmit the input signal from the rotation detected by said rotation detection means, and an input means to an information-machines-and-equipment side by the wireless method using infrared radiation, In the wireless mouse which equipped each part with the power source which supplies power at least The microswitch which detects change of the location of said press roller corresponding to the touch-down condition and the condition of not grounding of said ball, The wireless mouse characterized by having the functional means for switching which switches the function of said input means to the actuation means of the remote control equipment of various electrical machinery and apparatus based on the output of this microswitch.
[Claim 2] The ball arranged pivotable in a case, and two revolving shafts installed so that this ball might be contacted and it might intersect perpendicularly mutually, A rotation detection means to detect the rotation of said revolving shaft, and 1 or two or more input means, An information-transmission means to transmit the input signal from the rotation detected by said rotation detection means, and an input means to an information-machines-and-equipment side by the wireless method using infrared radiation, In the wireless mouse which equipped each part with the power source which supplies power at least The wireless mouse characterized by having a touch-down detection means to detect whether said ball has grounded, and the functional means for switching which switches the function of said input means to the actuation means of the remote control equipment of various electrical machinery and apparatus based on the output of this touch-down detection means.
[Claim 3] It is the wireless mouse according to claim 2 which is equipped with the press roller for pressing said ball to said revolving shaft, and is characterized by said touch-down detection means consisting of microswitches which detect the variation rate of said press roller accompanying the migration at the time of the touch-down of said ball, and un-grounding.
[Claim 4] It is the wireless mouse according to claim 2 or 3 characterized by for said input button switch and rotating wheel to generate command signals, such as sound-volume modification of audio-visual equipment and a channel change-over, when it has an input button switch and a rotating wheel, said electrical machinery and apparatus is audio-visual equipment as said input means and the function of said input means is switched by said functional means for switching to the actuation means of the remote-control equipment of a television television machine or video equipment.
[Claim 5] A wireless mouse given in any of claim 2 to claim 4 characterized by to have an information storing means store the information on said various electrical machinery and apparatus, to read the information on a predetermined electrical machinery and apparatus from said information storing means, and to have the control means controlled to make the signal which suits this electrical machinery and apparatus output from said information-transmission means in case it is switched to the remote-control equipment of various electrical machinery and apparatus by said functional means for switching they are.
[Claim 6] Said control means is a wireless mouse according to claim 5 characterized by controlling to make said information storing means memorize the information on the electrical machinery and apparatus chosen in these information machines and equipment while making the signal which displays the information on said various electrical machinery and apparatus on the display by the side of information machines and equipment from said information-transmission means to said information machines and equipment output based on predetermined actuation of said input means.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the wireless mouse which is the input manual operating device of information machines and equipment, such as a personal computer.
[0002]
[Description of the Prior Art] There is a pointing device conventionally called a "mouse" as an input device for specifying the location on a display screen in information machines and equipment, such as a personal computer (henceforth a personal computer). Have the ball which can rotate freely inside, and the sensor which detects a revolution of this ball, make some these balls face from a mouse base, and said ball rotates a mouse body on the flat surface of a mouse pad etc., this mouse detects the rotation direction and a rotation by the sensor, and inputs them into the body of a personal computer, and the pointer which calculates the migration direction and the movement magnitude of a mouse, and is called the "mouse cursor" on a display screen moves on a screen.
[0003] And there is the so-called wireless mouse which adopted the wireless method which transmits data by the dispatch section which used the infrared radiation with which the mouse side was equipped as one sort of a means which transmits the rotation direction of a ball and the detecting signal of a rotation to the body of a computer from a mouse, and the receive section with which the body side of a personal computer was equipped.
[0004] Moreover, in these mice, the mouse of the multifunctional mold to which additional functions other than the function to specify the location on a display screen in a personal computer etc. as mentioned above were added also exists.
[0005] As an example of a configuration of the conventional multifunctional mold mouse, the "data entry unit" indicated by JP,9-160716,A, for example, the "multiplex functional mouse" indicated by the patent No. 2609370 official report, etc. are proposed.
[0006] A position detection means by which the above "a data entry unit" detects the position of the body of a pointing device, The voice input means built in said body of a device, and the 1st processing activation means which performs functional processing as a pointing device when it is detected by said position detection means that the body of a device is in a normal state, Only by providing the 2nd processing activation means which performs functional processing as said voice input means, and changing the position of the body of a pointing device, when it is detected by said position detection means that the body of a device is in a specific condition It is made to function as a usual others and voice input device or a usual image photography device. [pointing device]
[0007] Moreover, the above "a multiplex functional mouse" is set to the mouse which has the input carbon button group which consists of 1 or two or more input carbon buttons which are used as a coordinate input device of information machines and equipment, such as a personal computer. It has a touch-down detection means to detect whether the mouse has grounded or not, and the functional means for switching which switches the function of the input carbon button of said input carbon button group based on the output of this touch-down detection means. Two or more functions are given to each input carbon button of an input carbon button group according to whether it is in the condition which the mouse grounded, or it is in the condition which has not been grounded.
[0008]
[Problem(s) to be Solved by the Invention] By the way, remote control equipment (henceforth remote control) can be attached to many, such as a television television machine and video equipment, and volume control and selection of a channel can be performed now to them by wireless. And these remote control has many which have adopted the infrared method as a transmission system of a signal.

[0009] Since he watches television or there is also often an opportunity to operate video, operating information machines and equipment, such as a personal computer, it is convenient if you can use the wireless mouse of the above infrared methods also as remote control of an electrical machinery and apparatus. However, the wireless mouse which added such a remote control function did not exist.
[0010] This invention is thought out that the above-mentioned trouble should be solved, and aims at offering the wireless mouse which can be switched to the function as remote control of various electrical machinery and apparatus.

[0011]
[Means for Solving the Problem] The ball arranged pivotable in a case (case 2) in order to attain the above-mentioned object (mouse ball 4), Two revolving shafts installed so that this ball might be contacted and it might intersect perpendicularly mutually (5 6), A rotation detection means to detect the rotation of said revolving shaft (optical revolution encoders E1 and E2), One or two or more input means (push buttons 10 and 11, rotating wheel equipment 20), An information-transmission means to transmit the input signal from the rotation detected by said rotation detection means, and an input means to an information-machines-and-equipment side by the wireless method using infrared radiation (infrared output section 30), In the wireless mouse which equipped each part with the power source which supplies power at least A touch-down detection means to detect whether said ball has grounded (press roller device 100), Based on the output of this touch-down detection means, it had the functional means for switching (control unit) which switches the function of said input means to the actuation means of the remote control equipment of various electrical machinery and apparatus (television etc.).
[0012] By this, when the ball has grounded to the mouse pad etc., it is made to function as a usual mouse, and when it raises and a ball changes into the condition of not grounding, it can be made to function as remote control of various electrical machinery and apparatus.
[0013] Moreover, it has a press roller (13) for pressing said ball to said revolving shaft, and said touch-down detection means may be made to consist of microswitches which detect the variation rate of said press roller accompanying the migration at the time of the touch-down of said ball, and un-grounding. It is detectable whether the ball has grounded with the simple configuration by this.
[0014] Moreover, it has an input button switch and a rotating wheel, and when the function of said input means is switched to the actuation means of the remote control equipment of a television television machine or video equipment by said functional means for switching, you may make it said electrical machinery and apparatus be audio-visual equipment, and said input button switch and rotating wheel generate command signals, such as sound-volume modification of audio-visual equipment and a channel change-over, as said input means. Thereby, remote control actuation of audio-visual equipments, such as a television television machine and video equipment, can be performed, operating information machines and equipment, such as a personal computer.
[0015] Moreover, it has an information storing means to store the information on said various electrical machinery and apparatus, and in case it is switched to the remote control equipment of various electrical machinery and apparatus by said functional means for switching, the information on a predetermined electrical machinery and apparatus is read from said information storing means, and you may make it have the control means controlled to make the signal which suits this electrical machinery and apparatus output from said information-transmission means. Thereby, it can be made to correspond to remote control actuation of two or more electrical machinery and apparatus.
[0016] Furthermore, said control means is also controllable to make said information storing means memorize the information on the electrical machinery and apparatus chosen in these information machines and equipment while making the signal which displays the information on said various electrical machinery and apparatus on the display by the side of information machines and equipment from said information-transmission means to said information machines and equipment output based on predetermined actuation of said input means. Thereby, the electrical machinery and apparatus which carries out remote control actuation can be easily chosen from the display of information machines and equipment, and can be set up.
[0017]
[Embodiment of the Invention] Hereafter, the suitable operation gestalt of this invention is explained based on the drawing of drawing 1 - drawing 5 .
[0018] It is the explanatory view in which the side elevation of the wireless mouse which drawing 1 requires for this operation gestalt and a top view, and drawing 2 show the decomposition top view of the important section, and drawing 3 shows the outline configuration of a touch-down detection means.
[0019] A wireless mouse 1 contains the mouse ball 4 removable to the ball holder (not shown) formed in case 2 center

section made of synthetic resin, equips soffit opening of the above-mentioned ball holder with annular covering (not shown) removable, and holds the above-mentioned mouse ball 4 free [a revolution] as shown in drawing 1 and drawing 2 . Furthermore, it is constituted so that the soffit section of the above-mentioned mouse ball 4 may be exposed outside from opening of the above-mentioned covering.

[0020] As shown in drawing 2 , two revolving shafts 5 and 6 which intersect perpendicularly with the front face of the above-mentioned mouse ball 4 mutually are contacted, the disks 5a and 6a of the optical revolution encoders E1 and E2 are rotated through these revolving shafts 5 and 6, and the signal which carries out photo electric translation with the optical couplers 7 and 8, and is equivalent to the rotation direction and rotation of the mouse ball 4 is outputted.

[0021] Moreover, near the mouse ball 4, the press roller device 100 which serves as a functional means for switching is established.

[0022] The press roller device 100 consists of an energization member 14 which becomes the mouse ball 4 and the housing 110 movable in the direction to estrange from the pivotable press roller 13 supported to revolve, the spring which energizes housing 110 at the mouse ball 4 side through a revolving shaft 12, and a microswitch 15 turned on / turned off by migration of the housing 110 accompanying vertical movement of the mouse ball 4. In addition, about the structure which the press roller device 100 moves with vertical movement of the mouse ball 4, it mentions later.

[0023] Moreover, two push-buttons 10 and 11 are formed in the top face of a case 2, and the microswitch (not shown) turned on when a carbon button is pushed on these push-button 10 and 11 bottom is formed. And the manipulate signal which directs a switch in a mode of operation or input mode etc. is outputted by operating push-buttons 10 and 11.

[0024] Furthermore, among push-buttons 10 and 11, the rotating wheel 20 for giving the scrolling command of the display screen on a screen etc. is formed.

[0025] The output section 30 of an infrared signal is formed and the various signals based on actuation of push-buttons 10 and 11 or a rotating wheel 20 are outputted to the front-face side of a case 2 as an infrared signal to the receive section by the side of information machines and equipment, such as a personal computer.

[0026] Moreover, although a graphic display is omitted, in the case 2, the control unit which consists of CPU, RAM, a ROM, etc. is formed. CPU performs ON of said microswitch 15 / control which is based off and switches the function as a usual mouse, and the function as a remote control unit. The function of a mouse is switched by specifically storing in ROM the data which realize the function of the usual mouse, and the data which realize the function as a remote control unit in the form of the table, reading the data of a predetermined table from ROM and writing in the predetermined field of RAM by control of CPU based on ON / off signal of a microswitch 15.

[0027] In addition, you may make it prepare two or more data according to the model of audio-visual equipments, such as television and video equipment, and manufacturer who perform remote control actuation as table data which realize the function as a remote control unit stored in ROM. Thereby, it can be made to correspond to the model of broad audio-visual equipment. About the selection method of a model, it mentions later based on the flow chart of drawing 4 .

[0028] Moreover, although a graphic display is not carried out, in a case 2, the cell which supplies a power source to each part, such as a control unit, is contained.

[0029] Next, with reference to drawing 3 , the structure which the press roller device 100 moves with vertical movement of the mouse ball 4 is explained.

[0030] When the overall diameter of the mouse ball 4 is set to R, as shown in drawing 3 (a), in the condition that the mouse ball 4 has grounded on the front face of a mouse pad P, revolving shafts 5 and 6 (this revolving shaft is in the background of the mouse ball 4, and does not appear in drawing 3) contact the mouse ball 4 in the location of an overall diameter R. In this condition, the press roller 13 of the press roller device 100 contacts the mouse ball 4, and is pressed in the location of the path r smaller than an overall diameter R. In this case, since housing 110 also moves to the mouse ball 4 side with the press roller 13, the back end section of housing 110 and switch piece 15a of a microswitch 15 will be in the condition of having estranged, and a microswitch 15 will be in an OFF state. And when there is no signal from a microswitch 15, CPU of a control device performs control and processing so that it may function as a usual mouse.

[0031] On the other hand, if the case 2 of a wireless mouse 1 is lifted, the about several mm mouse ball 4 will move below with a self-weight (drawing 3 (b)). And the location of the overall diameter R of the mouse ball 4 which moved below corresponds to the press roller 13, and as the mouse ball 4 pushes the press roller 13 of the press roller device 100 on an arrow-head A side, it contacts. Thereby, housing 110 also moves to an arrow-head A side with the press roller 13, and the back end section of housing 110 will push in switch piece 15a of a microswitch 15, and will be

in an ON state. And when there is an ON signal from a microswitch 15, CPU of a control device performs control and processing so that it may function as a remote control unit.
[0032] Here, with reference to the flow chart of drawing 4 , the configuration procedure of the electrical machinery and apparatus which carries out remote control actuation, and the change-over procedure to a remote control function are explained.
[0033] First, the push-buttons 10 and 11 of right and left at step S100 judge whether predetermined time (for example, 3 seconds) ON was carried out, in "No", shift at step S106, and, in "YES", shift at step S101. At step S101, based on the infrared signal from a wireless mouse, information machines and equipment, such as a personal computer, start the remote control code setting-out software of an electrical machinery and apparatus (this operation gestalt television), and shift to step S102. At step S102, the list of the remote control codes stored in said ROM of a wireless mouse 1 is displayed on a display, and it progresses to step S103. A remote control code is displayed for every model of television, and every (refer to drawing 5) manufacturer.
[0034] At step S103, it is judged whether the desired remote control code was chosen by actuation of the push-buttons 10 and 11 on either side and rotating wheel equipment 20, when not yet chosen, it shifts to step S102, and return and when it is chosen, it shifts to step S104.
[0035] At step S104, by control of CPU by the side of a wireless mouse 1, the table data applicable to the remote control code chosen from ROM are read, it writes in the predetermined field of RAM, and a remote control code is decided. Subsequently, at step S105, it judges whether predetermined time (for example, 3 seconds) ON of the push-buttons 10 and 11 on either side was carried out, and, in "YES", shifts at step S106, and it stands by until it is pushed in "No."
[0036] At step S106, it is judged whether it was turned on for the functional means for switching 100 that it is [15] ON, i.e., a microswitch, and in being "No", it shifts to step S107 and operates in the usual mouse mode (namely, when the mouse ball 4 is in the condition of having grounded to the mouse pad etc.). On the other hand, at step S106, in "YES", it judges whether it shifted to step S108 and the revolution of the mouse ball 4 was detected, in "YES", it shifts at step S107, in return and "No", progresses to step S109 at the usual mouse mode, and remote control mode is operated (namely, when a mouse is lifted and the mouse ball 4 is in a mouse pad etc. and the condition of not grounding).
[0037] In addition, in remote control mode, a channel can be switched for the actuation which lowers sound volume for the actuation which raises sound volume with a push button 10 with a push button 11, for example by revolution actuation of a rotating wheel 20.
[0038] Volume control and a channel change-over of television etc. can be performed only by raising a wireless mouse 1 while the functional means for switching 100 being in an ON state, and being able to function as a remote control unit, for example, operating information machines and equipment, such as a personal computer, by the wireless mouse, if the functional means for switching 10 will be in an OFF state, it functions as a usual mouse and a mouse is lifted in placing on a mouse pad etc. and using a wireless mouse 1 by this.
[0039] In addition, although this operation gestalt explained the case where remote control actuation of television was enabled by the functional means for switching prepared in a wireless mouse 1, it is not restricted to this, and it is applicable if it is an electrical machinery and apparatus using the remote control unit of infrared methods, such as video equipment.
[0040] Moreover, although this operation gestalt explained the configuration whose mouse ball 4 detects whether it is a touch-down condition, and switches a function by detecting migration of the housing 11 accompanying the drop of the mouse ball 4 with a microswitch 15, you may be anything as long as it is the method which is not limited to this and can detect whether it is the touch-down condition of a mouse ball. That is, you may make it detect migration of a mouse ball, for example using a pressure sensor, an optical sensor, etc.
[0041] it can change variously in the range which this invention is not limited to the above-mentioned operation gestalt, and does not deviate from the summary although invention made by this invention person above was concretely explained based on the example -- it is natural.
[0042]
[Effect of the Invention] The ball which will have been arranged pivotable in a case if this invention was followed, and two revolving shafts installed so that this ball might be contacted and it might intersect perpendicularly mutually, A rotation detection means to detect the rotation of said revolving shaft, and 1 or two or more input means, An information-transmission means to transmit the input signal from the rotation detected by said rotation detection means, and an input means to an information-machines-and-equipment side by the wireless method using infrared

radiation, In the wireless mouse which equipped each part with the power source which supplies power at least It is based on the output of a touch-down detection means to detect whether said ball has grounded, and this touch-down detection means. Since it had the functional means for switching which switches the function of said input means to the actuation means of the remote control equipment of various electrical machinery and apparatus When the ball has grounded to the mouse pad etc., it is made to function as a usual mouse, and when it raises and a ball changes into the condition of not grounding, it can be made to function as remote control of various electrical machinery and apparatus.

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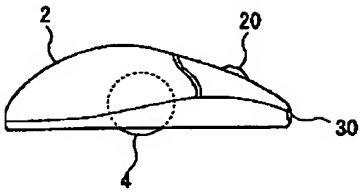
DRAWINGS

[Drawing 1]

(a)



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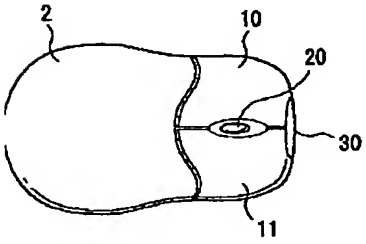
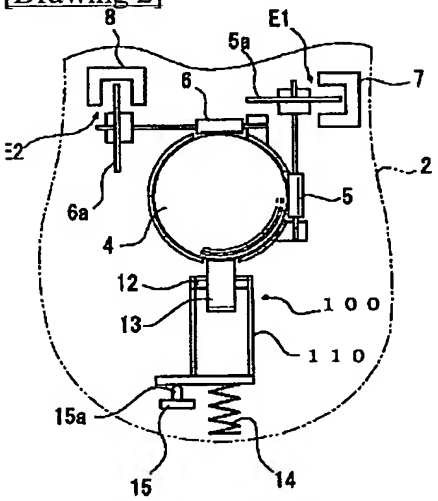
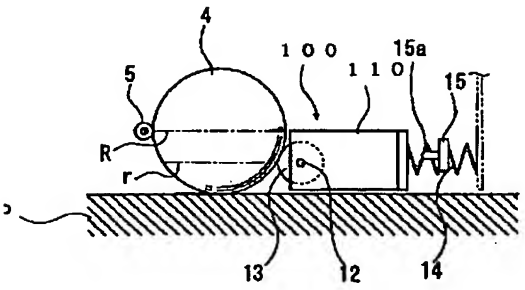


[Drawing 2]



[Drawing 3]

(a)



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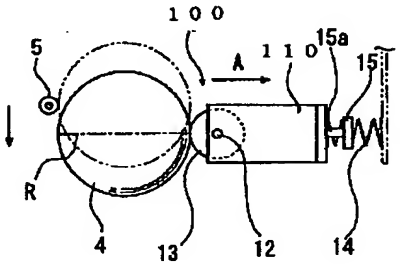
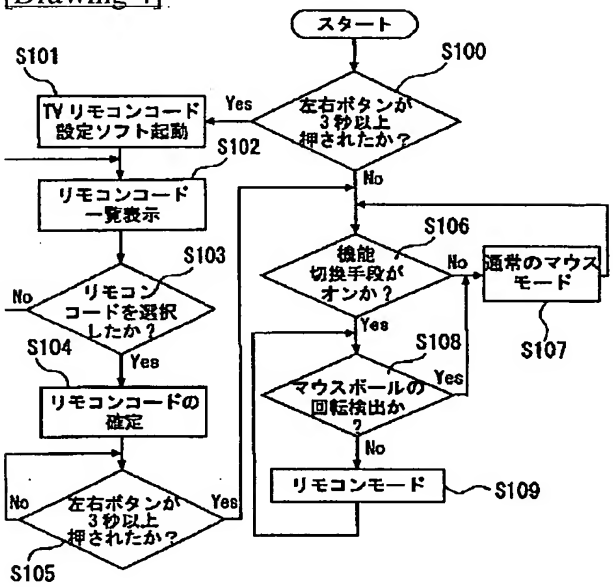
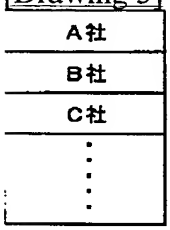


[Drawing 4]



[Drawing 5]



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